

PATOKA LAKE  
Crawford, Dubois, and Orange Counties  
2007 Fish Management Report

Daniel P. Carnahan  
Fisheries Biologist



Fisheries Section  
Indiana Department of Natural Resources  
Division of Fish and Wildlife  
I.G.C.-South, Room W273  
402 W. Washington Street  
Indianapolis, Indiana 46204

2008

## EXECUTIVE SUMMARY

- Patoka Lake is an 8,800-acre flood control reservoir. There are 11 boat ramps at the lake. The lake is best known for its quality largemouth bass fishing. The lake also has good fishing for channel catfish, crappie, white bass, and striped bass.
- There were three surveys conducted in 2007. A supplemental electrofishing survey in April, an angler creel survey that ran from April through October, and a striped bass survey that occurred in October. Data submitted by largemouth bass tournaments is also summarized.
- Twenty-one fish species were sampled totaling 3,951 fish that weighed approximately 994 lbs. Bluegill were most abundant by number (62%), followed by longear sunfish (14%), largemouth bass (10%), gizzard shad (5%), and green sunfish (2%).
- One yellow bass was collected in the supplemental survey and many were observed during the striped bass survey. This species has never previously been recorded from Patoka Lake. Yellow bass are a prolific predator and are sure to compete with the crappie, striped bass, and largemouth bass populations.
- An estimated 65,860 anglers fished approximately 324,313 h (37 h/acre) from April 1 through October 31. Fishing pressure was highest in April and May and lowest in October. The total estimated harvest was 117,007 fish that weighed 59,976 lbs.
- Twenty-four tournament days were reported. A total of 3,488 anglers caught 3,225 legal size bass that weighed approximately 9,135 lbs. The average weight and length of a weighed-in bass was 2.8 lbs and 16.8 in.
- A total of 156 striped bass was sampled that ranged in length from 3.6 to 36.1 in. The largest sampled weighed just under 16 lbs. The catch rates were 21.7/electrofishing h and 1.9/gill net lift.
- Specific largemouth bass sampling should be conducted in the spring of 2009. The primary sampling objective will be to obtain more accurate age data by collecting otoliths and spines from a subsample of the catch. This sampling will replace the 2009 supplemental electrofishing survey.

## TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES .....	iii
LIST OF FIGURES .....	iv
INTRODUCTION .....	1
METHODS .....	1
Supplemental survey .....	1
Angler creel survey .....	2
Largemouth bass tournaments .....	2
Striped bass survey .....	2
RESULTS .....	3
Supplemental survey .....	3
Angler creel survey .....	5
Largemouth bass tournaments .....	7
Striped bass survey .....	7
DISCUSSION .....	8
RECOMMENDATIONS .....	10
LITERATURE CITED .....	10
APPENDIX 1, Supplemental survey data .....	21
APPENDIX 2, Largemouth bass tournament results for 2007 .....	38
APPENDIX 3, Striped bass survey data .....	39

## LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Boat ramp usage probabilities.....	12
2. Estimated number of anglers, hours of fishing pressure, and overall harvest rates by month in 2007 .....	12
3. Numbers and pounds of fish harvested from April 1 through October 31, 2007 .....	13
4. Number harvested of selected species from 1996 through 2007 .....	13
5. Comparison of harvest, yield, harvest rate, and average lengths from 1986 through 2007...	14
6. Estimated numbers (percent) of largemouth bass caught and released from 1989 through 2007.....	15
7. Origin of anglers interviewed during 2007 .....	16

## LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Bluegill growth for age 3 through age 5, 1996 through 2007.....	17
2. Bluegill and largemouth bass PSD values, 1994 through 2007.....	18
3. Bluegill RSD values, 1991 through 2007 .....	18
4. Largemouth bass RSD values, 1996 through 2007.....	19
5. Anglers satisfaction with the fishery in 2007 (0 = not satisfied, 10 = very satisfied) .....	19
6. Tournament catch rates for legal size largemouth bass, 1993 through 2007.....	20
7. Total fishing hours needed to weigh-in one largemouth bass greater than 18.0 in .....	20

## INTRODUCTION

Patoka Lake is an 8,800-acre flood control impoundment located in Crawford, Dubois, and Orange Counties. The reservoir was created in 1977 when a dam was completed across the Patoka River 13 mi east of Jasper. The Department of Natural Resources (DNR) operates seven State Recreation Areas at the lake. The Newton-Stewart State Recreation Area is the most developed with campgrounds, swimming beach, visitor center, marina, and other attractions. Eleven boat launching ramps provide anglers and boaters access to the lake. The Kings Bridge boat ramp is an unimproved ramp while the other boat ramps are concrete. There is a \$5.00 non-motorized and \$20.00 motorized annual statewide lake pass for boats. If accessing the lake through the Newton-Stewart Recreation Area there is also an additional entrance fee. Areas for bank fishing are numerous and are located by any road bordering the lake.

Largemouth bass were protected by a 14.0-in minimum length limit through 1988. A 12.0 to 15.0-in bass slot size limit was enacted in May 1989 and was changed to a 15.0-in minimum length limit in 1996. This regulation was also timely due to the appearance of gizzard shad in June 1996.

In 2006, gizzard shad were more abundant than bluegill for the first time in 4 years. Bluegill stock density indices (PSD, RSD-7, and RSD-8) have not significantly changed and indicate that fish less than 6.0 in continue to dominate the bluegill population. The largemouth bass electrofishing catch rate returned to normal levels after being unusually high in 2005. The bass stock indices all indicate a well balanced population with a good proportion of large bass.

## METHODS

### Supplemental survey

The supplemental survey was conducted from April 16 through April 18, 2007. Fish collection effort consisted of 3.0 h of pulsed DC night electrofishing with two dippers. Fish collected were measured to the nearest 0.1 in TL. Weights for all species were determined from either the Fish Management District 7 averages or the standard weight equations (Anderson and Neuman 1996). Proportional stock density and RSD indices were used to evaluate the largemouth bass and bluegill populations (Anderson and Neuman 1996). The bluegill fishing potential index (BGFP) was used to evaluate the quality of the bluegill fishing (Ball and Tousignant 1996). A single factor analysis of variance statistical test was used to compare some

of the pre and post gizzard shad era data. Scale samples were taken from a subsample of sport fish for age and growth analysis.

### Angler creel survey

The angler creel survey was conducted from April 2 through October 31, 2007. The stratified random sampling design for this creel survey was based on non-uniform angler usage probabilities as described by Pollock et al. (1994).

The two creel clerk's work assignments were based on activity probabilities as generated by a random numbers table and scheduled for bi-weekly pay periods. Each clerk normally worked 10 d per 14-d pay period and most weekend days were worked. Each clerk was assigned to specific boat ramps so the creel data could be stratified between the clerks. Boat ramp usage probabilities, based on previous Patoka Lake angler creel survey data, were used for the present study (Table 1). Fishing activity probabilities representing the time of day (0.5 for the morning shift; 0.5 for the afternoon shift) were also used. Expansion factors were applied to the daily observation totals for each observed category as described in Pollock (1994) to provide projections of monthly lake-wide fishing pressure and harvest. Yield estimates were determined by length group weight data from District 7 averages.

Anglers were interviewed at the end of their fishing trips. Typical information included the number of anglers in a fishing party, fishing trip length, species sought by anglers, number of harvested fish by species, numbers of largemouth and striped bass released by size group, angler satisfaction with their fishing trip, and county of residence. The clerks measured the TL of harvested fish to the nearest 0.5 in.

### Largemouth bass tournaments

Organizations conducting tournaments were mandated by their permit to record and send in their bass tournament data to the Division of Fish and Wildlife. Data sheet information included hours fished, number of participants, big bass weight, total weight, and total number weighed-in. Recording bass lengths to the nearest 0.5 in was optional.

### Striped bass survey

Striped bass were surveyed from October 2 through October 10, 2008. Sampling effort

consisted of 5.75 h of pulsed DC night electrofishing with two dippers and 16 gill net lifts. Electrofishing stations were 15 min long and randomly located throughout the main lake. The experimental multifilament nylon gill nets were 300 ft long and 6 ft deep. Four equal length mesh panels ranged from 1.5 to 3.0 in mesh size. Nets were typically set over the river channel in the main lake and suspended 5 ft deep. All striped bass were measured to the nearest 0.1 in, weighed to the nearest 0.25 lb, and otoliths were removed from a subsample of striped bass for age analysis. Temperature and DO profiles were measured on October 5 and October 29.

## RESULTS

### Supplemental survey

Twenty-one fish species were sampled totaling 3,951 fish that weighed approximately 994 lbs. Bluegill were most abundant by number (62%), followed by longear sunfish (14%), largemouth bass (10%), gizzard shad (5%), and green sunfish (2%). Common carp were most abundant by weight (45%), followed by largemouth bass (25%), bluegill (15%), gizzard shad (4%), and spotted sucker (3%). The complete list of species with their relative abundance is in Appendix 1.

A total of 2,432 bluegill was sampled that weighed 149 lbs. Bluegill ranged in length from 1.0 to 7.0 in. The electrofishing catch rate increased from 336.8 to 811.0/h. Age-4 and older bluegill grew slow when compared to the district's averages. Growth has significantly decreased for age-3 ( $F = 26.5$ ;  $df = 14$ ;  $P < 0.001$ ), age-4 ( $F = 24.6$ ;  $df = 14$ ;  $P < 0.001$ ), and age-5 ( $F = 20.5$ ;  $df = 14$ ;  $P < 0.001$ ) bluegill when compared to pre 1997 growth figures (Figure 1). For example, an age-5 bluegill in 1996 averaged 8.8 in compared to 5.9 in presently.

The bluegill PSD was 10 (Figure 2). The PSDs have been less than 11 since 1998 and are significantly lower since 1996 ( $F = 22.5$ ;  $df = 14$ ;  $P < 0.001$ ). The PSD should be in the range of 20 to 60 for a balanced population. The bluegill RSD-7 has been 1 the last four years and the RSD-8 has been 0 since 1998. Both indices have significantly decreased since 1996 ( $F = 112.5$ ,  $df = 14$ ,  $P < 0.0001$  and  $F = 72.2$ ;  $df = 14$ ;  $P < 0.0001$ ) (Figure 3). The BGFP value decreased from 11 to 10 (out of a possible 40), which rates bluegill fishing as marginal. The BGFP has ranged from 8 to 13 since 1998. The highest BGFP recorded was 24 in 1996.

A total of 557 longear sunfish was sampled that weighed 26 lbs. They ranged in length from 1.8 to 5.6 in. The electrofishing catch rate increased from 115.3 to 185.0/h.



A total of 376 largemouth bass was sampled that weighed 246 lbs. They ranged in length from 2.9 to 21.6 in. The electrofishing catch rate increased 28% to 125.3/h. Electrofishing catch rates have fluctuated between 87.5 and 143.0/h over the last five years. Bass growth was good and nearly identical to 2006 results. An age-4, 5, 6, and 7 bass averaged 13.1, 15.3, 17.0, and 18.5 in (Appendix 1).

The bass PSD decreased from 58 to 31 and is currently lower than the range specified for a balanced population (40 to 70) (Figure 2). The RSD-15 index value decreased from 34 to 12 and the RSD-18 index decreased from 9 to 5 (Figure 4). Even though these indices all decreased, they are still significantly better than pre-1997 values (PSD ( $F = 20.6$ ,  $df = 14$ ,  $P < 0.001$ ); RSD-15 ( $F = 9.1$ ,  $df = 14$ ,  $P < 0.01$ ); RSD-18 ( $F = 4.8$ ,  $df = 14$ ,  $P = 0.04$ )).

A total of 208 gizzard shad was sampled that weighed 37 lbs. They ranged in length from 3.5 to 12.0 in. The gizzard shad electrofishing catch rate decreased from 446.2 to 69.3/h. Previous electrofishing catch rates ranged from 274.0 (2002) to 1,401.0/h (2001).

A total of 63 white crappie and 25 black crappie was sampled. White crappie ranged in length from 6.0 to 11.6 in, while black crappie ranged from 3.8 to 8.7 in. The relative abundance by number and weight for white and black crappie were both less than 2%. Electrofishing catch rates were 21.0/h for white crappie and 8.0/h for black crappie. The electrofishing catch rates for white and black crappie in 2006 were 14.9 and 2.6/h. Both black and white crappie grew slow. Age-4 and age-5 white crappie averaged 8.3 and 10.1 in and black crappie of the same age averaged 7.8 and 8.0 in.

Thirty-nine redear sunfish were sampled that weighed 7 lbs. They ranged in length from 4.2 to 9.9 in. Their relative abundance was 1% by both number and weight. The electrofishing catch rate decreased from 25.6 to 13.0/h. Redear sunfish grew slow with age-4 and age-5 redear averaging 6.7 and 7.6 in.

Other sport fish sampled in low numbers were white bass (7), channel catfish (5), striped bass (2), and smallmouth bass (2). One 7.7 in yellow bass was sampled which was the first record of a yellow bass being caught at Patoka Lake.

#### Angler creel survey

An estimated 65,860 anglers fished approximately 324,313 h (37 h/acre) from April 1 through October 31. Fishing pressure was highest in April and May and lowest in October

(Table 2). Fishing pressure ranged from 39 h/acre in 2000 to 54 h/acre in 1996.

The overall harvest rate nearly doubled from 2003 to 0.36 fish/h. Harvest rates in 1996 and 2000 were 1.18 and 0.33 fish/h. Monthly harvest rates ranged from 0.55 (May) to 0.11 fish/h (August). The overall catch rate (harvested plus released fish) was 0.66 fish/h. Previous catch rates ranged from 0.41 (2003) to 1.29/h (1996).

The total estimated harvest increased by 68% from 2003 to 117,007 fish that weighed 59,976 lbs (Table 3). The total harvest has been on a decreasing trend since 1996 until this survey. The 1996 harvest was 559,067 fish compared to 113,665 in 2000, and 69,660 in 2003. Harvest increased for all species when compared to 2003.

A total of 92,228 crappie (10.6/acre) was harvested which was an increase of 61% from 2003 (Table 4). The last similar crappie harvest was in 1996 when 10.9/acre were harvested (Table 5). The average length of the harvested crappie was 8.9 in which was nearly identical to the 2000 and 2003 creel surveys. Crappie anglers accounted for 32% of the total anglers and 94% of the crappie harvest. They also harvested 48% of the white bass, 44% of the striped bass, 28% of the redear sunfish, 18% of the bluegill, 16% of the channel catfish, and 6% of the largemouth bass. Crappie anglers also caught 31% of the released striped bass and 5% of the released largemouth bass.

The bluegill harvest increased 89% to 16,547 which equates to 1.9/acre. The average length of the harvested bluegill was 5.9 in. In 1996, the bluegill harvest was 50.0/acre and the average length of the harvested bluegill was 8.5 in. Bluegill anglers accounted for 5% of the total anglers and 72% of the bluegill harvest, 10% of the redear sunfish harvest, and 1% of the largemouth bass harvest.

A total of 4,416 channel catfish was harvested (0.5/acre) which was a 267% increase from 2003. The average length of the harvested channel catfish increased from 17.3 to 20.2 in. Three percent of the anglers targeted catfish and they harvested 59% of the channel catfish, 3% of the redear sunfish, and no other species.

The largemouth bass harvest increased 6% to 2,045. The bass harvest has not significantly changed since the inception of the 15.0-in minimum length limit ( $F = 1.3$ ,  $df = 2$ ,  $P = 0.44$ ). The average length of the harvested bass was 16.3 in which was similar to 2000 and 2003 results.

The number of largemouth bass caught and released increased 18% to 95,923, of which

20,752 (22%) were greater than 15.0 in (Table 6). Since 2003, the number of bass released that are greater than 15.0 in appears to have plateaued at around 20,000. The number of released bass less than 15.0 in has ranged from 61,000 to 75,000 since 2000 and has usually comprised about 75% of the total. Largemouth bass was the most popular species with 43% of the anglers targeting them. Largemouth bass anglers caught 90% of the released largemouth bass, 85% of the harvested largemouth bass, and 45% of the released striped bass. Surprisingly, bass anglers also harvested 31% of the redear sunfish.

A total of 558 striped bass was harvested which was a 548% increase over the 86 harvested in 2003. In 2000, 312 striped bass were harvested. The average length of the harvested striped bass was 24.8 in which was a considerable increase from 18.1 and 20.9 in recorded in 2000 and 2003.

A total of 773 striped bass was caught and released, 17% (130) of which were greater than 18.0 in. In 2003, 598 striped bass were released and 30% were greater than 18.0 in. The striped bass fishing preference is low (2%) and the number of parties targeting stripers appears to have leveled off. In 2000, there were 187 striper parties and that number has increased to 335 (2003) and now 368 (2007). Striped bass anglers harvested 39% of the stripers and caught 9% of the released stripers. They caught few other species.

A total of 436 white bass was harvested which was a 137% increase from 2003. In 2000, 727 were harvested. The average length of the harvested white bass was 12.5 in. Less than 1% of the anglers targeted white bass but they harvested 41% of them.

A total of 418 redear sunfish was harvested that averaged 7.2 in. No parties were specifically fishing for redear.

Other species harvested in low numbers were common carp, flathead catfish, warmouth, bullhead spp., and longear sunfish.

Anglers that did not specify fishing for a particular species were classified as fishing for anything. This classification accounted for 15% of the total anglers.

All anglers were asked “Were you satisfied with your fishing trip?” Responses to the questions were based on a 0 (not satisfied) to 10 (very satisfied) scale. The overall average was 4.4. The most satisfied anglers, when broken down by angler preference categories, were fishing for catfish (4.7), largemouth bass (4.6), and crappie (4.5) (Figure 5). White bass anglers had the highest response (7.0), but only two anglers responded to the question, and anglers fishing for

“anything” had the lowest response (3.6).

Residents from 86 of Indiana's 92 counties fished Patoka Lake during the creel survey (Table 7). The top six Indiana counties were Floyd (9%), Harrison (8%), Clark (8%), Orange (8%), Dubois (8%), and Crawford (7%). All of these counties are near the lake. Non-resident anglers came from 10 states that comprised 9% of the total anglers. Most of the non-residents originated from Kentucky (6%) and Ohio (1%).

Fishing related expenditures such as bait, tackle, food, license fees, lodging, and transportation represents a monetary value for the Patoka Lake fishery. The average cost of a fresh water fishing trip in Indiana was \$63 in 2006, according to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U.S. Department of Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau 2006). The \$63 average was used for determining the economic value of Patoka Lake's fishery in 2007. The estimated 65,860 anglers who fished Patoka during the survey period contributed an estimated \$4.1 million to the economy.

#### Largemouth bass tournaments

Twenty-four tournament days were reported compared to 39 in 2006 and 53 in 2005. Eleven days were in the spring (March through May), nine during the summer (June through August), and four in the fall (September and October). A total of 3,488 anglers caught 3,225 legal size bass that weighed approximately 9,135 lbs (Appendix 2). The average weight and length of a weighed-in bass was 2.8 lbs and 16.8 in. The range of the “big bass” weights were 3.3 to 7.3 lbs and the average was just under 6 lbs. The catch rate was 0.11 bass/h which equates to 9.0 h fished for each bass weighed-in which was an improvement from the 11.1/h recorded in 2006. The catch rate has significantly increased since 1996 and has remained around 0.10 fish/h since 2002 ( $F = 41.33$ ,  $df = 19$ ,  $P < 0.0001$ ) (Figure 6). Since 2002, it has taken approximately 50 h of fishing to weigh-in a bass larger than 18.0 in (Figure 7).

#### Striped bass survey

Two temperature and DO profiles were taken in October because there was a striped bass kill that started around the end of September. It appeared that the lake turned over and then restratified and then turned over again due to the unusual fall temperatures. The first profile was

taken on October 15 and the thermocline was absent, but the DO decreased from 8.0 ppm to 3.1 ppm between 22 and 24 ft. During the October 29 profile, the lake had completely turned over as temperature and DO varied little.

A total of 156 striped bass was sampled that weighed 867 lbs. They ranged in length from 3.6 to 36.1 in and the largest weighed just under 16 lbs. The catch rates were 21.7/h electrofishing and 1.9/gill net lift (Appendix 3). The electrofishing catch rate for age-0 striped bass was less than 1/h with only four sampled. A large group of age-1 striped bass was sampled and a few age-2, age-5, and age-8 through age-10 year classes were well represented. Striped bass growth is starting to slow around age 8. Age-8 fish ranged from 29.6 to 30.0 in, while age-9 and age-10 fish length ranges were nearly identical at 31.3 to 33.0 in.

## DISCUSSION

Best fishing at Patoka Lake in 2007 was for largemouth bass, channel catfish, white crappie, and striped bass. The average size largemouth bass harvested was 16.3 in, while the average size caught in bass tournaments was 16.8 in. Channel catfish fishing continues to improve with every angler creel survey. The average length of harvested catfish topped 20.0 in and harvest also increased. White crappie are numerous and their average harvested length was 8.9 in. Striped bass are an underutilized resource at the lake with only 2% of the anglers targeting striped bass. The average length of the harvested striped bass was nearly 25.0 in.

Fishing pressure decreased from 2003 by approximately 4,000 h and 7,000 anglers, but the harvest increased by 68% along with substantial increases in the number of released largemouth and striped bass. All sport fish species showed an increased catch from 2003 levels.

Largemouth bass continue to be the most preferred species at Patoka. Bass electrofishing catch rates for fish greater than 15.0 in were low compared to previous years which was also reflected in the abnormally low stock indices. This was most likely due to the electrofishing survey being conducted three weeks earlier than normal due to scheduling conflicts. The creel survey results and tournament results both support this theory. The creel results showed a slight increase in bass harvest. The number of released bass increased by 17% with the proportion of legal bass remaining about the same. The tournament catch rate increased from 2006 and the amount of time it took tournament anglers to weigh-in an 18.0 in bass has fluctuated little since 2002. Overall, bass fishing should be excellent at Patoka due to the population's good growth

and size distribution. Specific largemouth bass sampling should be conducted in the spring of 2009. The primary sampling objective will be to obtain more accurate age data by collecting otoliths and spines from a subsample of the catch. This sampling will replace the 2009 supplemental electrofishing survey.

White crappie are the primary target of panfish anglers at Patoka with approximately 100,000 harvested in 2007 that averaged nearly 9.0 in. White crappie are the dominate crappie species. White crappie and black crappie electrofishing catch rates both increased while growth remains poor. The high abundance of crappie is the main contributor to the slow growth. Crappie growth has improved in years of low reproduction or when they attain sizes large enough to prey on gizzard shad. Unfortunately, crappie reproduction is normally good at Patoka Lake which will continue to lead to slow growth and abundance of small crappie. A crappie trap netting survey will be conducted in 2008 to obtain more information about the population.

Bluegill fishing was poor in 2007, but the harvest did double from 2003. The population is stunted as the average length of the harvested bluegill was less than 6.0 in. Since gizzard shad have become established, all bluegill population indices have substantially declined. The largest bluegill sampled during the supplemental survey was 7.0 in and 91% of the 2,432 bluegill sampled were less than 6.0 in.

Striped bass fishing opportunities continue to be good with little competition between anglers. Gill net catch rates decreased to 1.9/lift, but the electrofishing catch rate skyrocketed to 21.7/h due to large concentrations of stripers along the shoreline during the survey. Typically the electrofishing survey is used to evaluate the current years stocking success as older striped bass are not normally caught by electrofishing. Only four age-0 striped bass were sampled which is a strong indicator of a weak year class and poor survival. However, a large abundance of age-1 stripers were sampled. Currently, there are six year classes present from the 10 year old stocking program.

The striped bass population may be reaching its upper limits in size potential. This year was the first that a substantial striped bass kill occurred. All of the mortalities were large fish. It appeared that the age-8 through age-10 fish were severely stressed by the hot dry summer as their average weights were down by about 2 lbs. Growth is also slowing as indicated by overlapping length ranges (30.0 to 33.0 in) for the age-8, age-9, and age-10 striped bass.

The channel catfish population has been steadily increasing since 1996 as indicated by

the increased gill net catch rates and harvest figures. There is a high abundance of good size channel catfish available with few anglers targeting them.

The gizzard shad catch rate of 69.3/h was considerably lower than the normal 250 to 450/h. The catch rate was artificially low because many gizzard shad were observed during the survey but not captured. The shad were not along the shoreline during the survey, but when a spotlight was shined across the water in the middle of the lake, thousands of shad would start to surface.

One yellow bass was sampled in the supplemental survey and many were observed during the striped bass survey. This species has never been previously recorded from Patoka Lake. Yellow bass are a prolific predator and are sure to compete with the crappie, striped bass, and largemouth bass populations.

#### RECOMMENDATIONS

- Specific largemouth bass sampling should be conducted in the spring of 2009. The primary sampling objective will be to obtain more accurate age data by collecting otoliths and spines from a subsample of the catch. This sampling will replace the 2009 supplemental electrofishing survey.

#### LITERATURE CITED

Anderson, R. O. and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-481 *in* B. Murphy and D. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda Maryland.

Ball, R. L. and J. N. Tousignant. 1996. The development of an objective rating system to assess bluegill fishing in lakes and ponds. Research report. Indiana Department of Natural Resources. Indianapolis, Indiana. 18 pp.

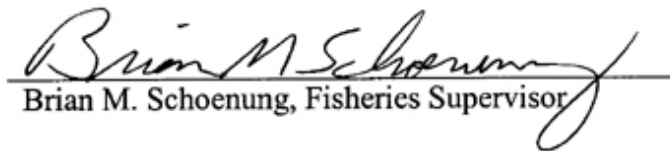
Pollock, K. H., C. M. Jones, and T. L. Brown. 1994. Angler survey methods and their applications in fisheries management. American Fisheries Society Special Publication 25.

U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2006 national survey of fishing, hunting, and wildlife-associated recreation. 165 pp.

Submitted by: Daniel P. Carnahan, Fisheries Biologist

Date: February 14, 2008

Approved by:

  
Brian M. Schoenung, Fisheries Supervisor

Date: May 21, 2008



Table 1. Boat ramp usage probabilities.

Ramp	Probability
Lick Fork	0.181
South Lick Fork	0.308
Newton Stewart South	0.216
Newton Stewart	0.218
Fisherman Campground	0.077
Little Patoka	0.249
Walls	0.149
Painter Creek	0.270
Jackson	0.017
Osborne	0.246
Kings Bridge	0.069

Table 2. Estimated number of anglers, hours of fishing pressure, and overall harvest rates by month in 2007.

Month	Number of anglers	Fishing pressure (hours)	Harvest rate (fish/hour)
April	12,360	69,301	0.43
May	14,812	71,039	0.55
June	9,729	44,121	0.36
July	11,588	52,217	0.22
August	4,838	29,455	0.10
September	7,333	34,694	0.34
October	5,199	23,486	0.26
Totals	65,860	324,313	0.36

Table 3. Numbers and pounds of fish harvested from April 1 through October 31, 2007.

Species	Harvest by number	Percent	Harvest by weight (lbs)	Percent
Crappie	92,228	78.8	35,047	58.4
Bluegill	16,547	14.1	2,813	4.7
Channel catfish	4,416	3.8	12,410	20.7
Largemouth bass	2,045	1.7	4,909	8.2
Striped bass	558	0.5	3,784	6.3
White bass	436	0.4	392	0.7
Redear sunfish	418	0.4	113	0.2
Other*	330	0.3	**	
Common carp	28	< 0.1	508	0.8
Totals	117,007		59,976	

\* Warmouth, bullhead spp., longear sunfish, green sunfish.

\*\* Not recorded.

Table 4. Number harvested of selected species from 1996 through 2007.

Year	Crappie	Bluegill	Largemouth bass	Channel catfish	White bass	Redear sunfish	Striped bass	Totals
1996	95,887	440,037	14,763	260	1,487	6,633	0	559,067
2000	75,635	33,777	1,720	1,197	727	297	312	113,353
2003	57,439	8,772	1,934	1,203	184	42	86	69,660
2007	92,228	16,547	2,045	4,416	436	418	558	116,649

Table 5. Comparison of harvest, yield, harvest rate, and average lengths from 1986 through 2007.

Species	Year							
	1986	1989	1991	1994	1996	2000	2003	2007
<b>Fish harvest (number/acre)</b>								
Bluegill	55.1	12.5	40.6	33.0	50.0	3.8	0.9	1.9
Largemouth bass	0.5	6.9	3.5	2.2	1.7	0.2	0.2	0.2
Crappie	3.6	2.3	3.4	3.6	10.9	8.6	6.5	10.5
Redear sunfish	5.2	1.2	4.8	1.7	0.8	<0.1	<0.1	<0.1
Striped bass*						<0.1	<0.1	0.1
Channel catfish	**	<0.1	<0.1	<0.1	<0.1	0.1	0.1	0.5
<b>Yield (pounds/acre)</b>								
Bluegill	12.3	6.3	15.3	13.5	23.5	0.5	0.1	0.3
Largemouth bass	1.2	3.4	4.4	1.4	1.1	0.4	0.5	0.6
Crappie	0.8	0.9	1.4	1.4	4.3	2.6	2.0	4.0
Redear sunfish	1.6	0.5	1.9	0.6	0.4	<0.1	<0.1	<0.1
Striped bass*						<0.1	<0.1	0.4
Channel catfish	**	**	<0.1	<0.1	<0.1	0.1	0.2	1.4
<b>Harvest rate (fish/hour)</b>								
Bluegill	1.32	0.28	0.61	0.61	0.93	0.10	0.02	0.05
Largemouth bass	0.01	0.15	0.05	0.04	0.03	0.01	0.01	0.01
Crappie	0.09	0.05	0.05	0.07	0.20	0.22	0.15	0.28
Redear sunfish	0.12	0.03	0.07	0.03	0.01	<0.01	<0.01	<0.01
Striped bass*						<0.01	<0.01	<0.01
Channel catfish	**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
<b>Average length (inches)</b>								
Bluegill	7.0	8.3	7.8	7.8	8.5	6.1	5.9	5.9
Largemouth bass	16.6	10.7	13.9	11.3	11.5	16.5	16.8	16.3
Crappie	8.1	9.2	10.2	9.4	10.0	8.8	9.0	8.9
Redear sunfish	7.2	8.4	8.4	8.1	9.5	7.1	7.8	7.1
Striped bass*						18.1	20.9	24.8
Channel catfish	**	**	**	**	**	16.4	17.3	20.2

\* Striped bass were first stocked in 1997.

\*\* Data not reported.

Table 6. Estimated numbers (percent) of largemouth bass caught and released from 1989 through 2007.

Year	<15 Inches	≥15 Inches	Total
1989*	168,148 (99)	613 (<1)	168,761
1991*	141,912 (97)	4,415 (3)	146,327
1994*	85,678 (97)	2,461 (3)	88,139
1996*	49,268 (96)	2,224 (4)	51,492
2000**	71,804 (86)	11,522 (14)	83,326
2003**	61,428 (75)	20,174 (25)	81,602
2007**	75,171 (78)	20,752 (22)	95,923

\* 12.0 to 15.0 inch slot length limit.

\*\* 15.0 inch minimum length limit.

Table 7. Origin of anglers interviewed during 2007.

County	Anglers	Percent	County	Anglers	Percent	State	Anglers	Percent
Floyd	426	8.9	Scott	16	0.3	Kentucky	279	5.8
Harrison	398	8.3	Vermillion	16	0.3	Ohio	55	1.2
Clark	390	8.2	Posey	15	0.3	Illinois	38	0.8
Orange	374	7.8	Franklin	14	0.3	Michigan	14	0.3
Dubois	356	7.5	Putnam	14	0.3	New Jersey	4	0.1
Crawford	352	7.4	Huntington	13	0.3	Tennessee	4	0.1
Marion	281	5.9	Dearborn	12	0.3	Maryland	3	0.1
Washington	118	2.5	Fulton	12	0.3	South Carolina	2	<0.1
Madison	109	2.3	Grant	12	0.3	West Virginia	2	<0.1
Johnson	108	2.3	LaGrange	11	0.2	Louisiana	1	<0.1
Lawrence	84	1.8	Warren	11	0.2			
Hendricks	77	1.6	Clay	10	0.2			
Vanderburgh	53	1.1	Pike	10	0.2			
Morgan	52	1.1	Fountain	9	0.2			
Monroe	50	1.0	Greene	9	0.2			
Warrick	49	1.0	Switzerland	9	0.2			
Hamilton	46	1.0	Wayne	9	0.2			
Perry	37	0.8	White	9	0.2			
St. Joseph	37	0.8	Clinton	8	0.2			
Gibson	35	0.7	Jennings	8	0.2			
Bartholomew	34	0.7	Rush	8	0.2			
Hancock	34	0.7	Wabash	8	0.2			
Spencer	34	0.7	Jasper	7	0.1			
Shelby	32	0.7	Owen	7	0.1			
Daviess	31	0.6	Starke	7	0.1			
Delaware	31	0.6	Whitley	7	0.1			
Howard	30	0.6	Decatur	6	0.1			
Vigo	29	0.6	Marshall	6	0.1			
Allen	27	0.6	Noble	6	0.1			
LaPorte	27	0.6	Dekalb	5	0.1			
Martin	26	0.5	Fayette	4	0.1			
Ohio	26	0.5	Pulaski	4	0.1			
Porter	26	0.5	Steuben	4	0.1			
Boone	25	0.5	Tipton	4	0.1			
Lake	25	0.5	Carroll	3	0.1			
Tippecanoe	25	0.5	Benton	2	<0.1			
Brown	24	0.5	Blackford	2	<0.1			
Ripley	23	0.5	Cass	2	<0.1			
Jefferson	22	0.5	Montgomery	2	<0.1			
Knox	22	0.5	Newton	2	<0.1			
Henry	19	0.4	Randolph	2	<0.1			
Jackson	19	0.4	Wells	2	<0.1			
Kosciusko	17	0.4	Jay	1	<0.1			

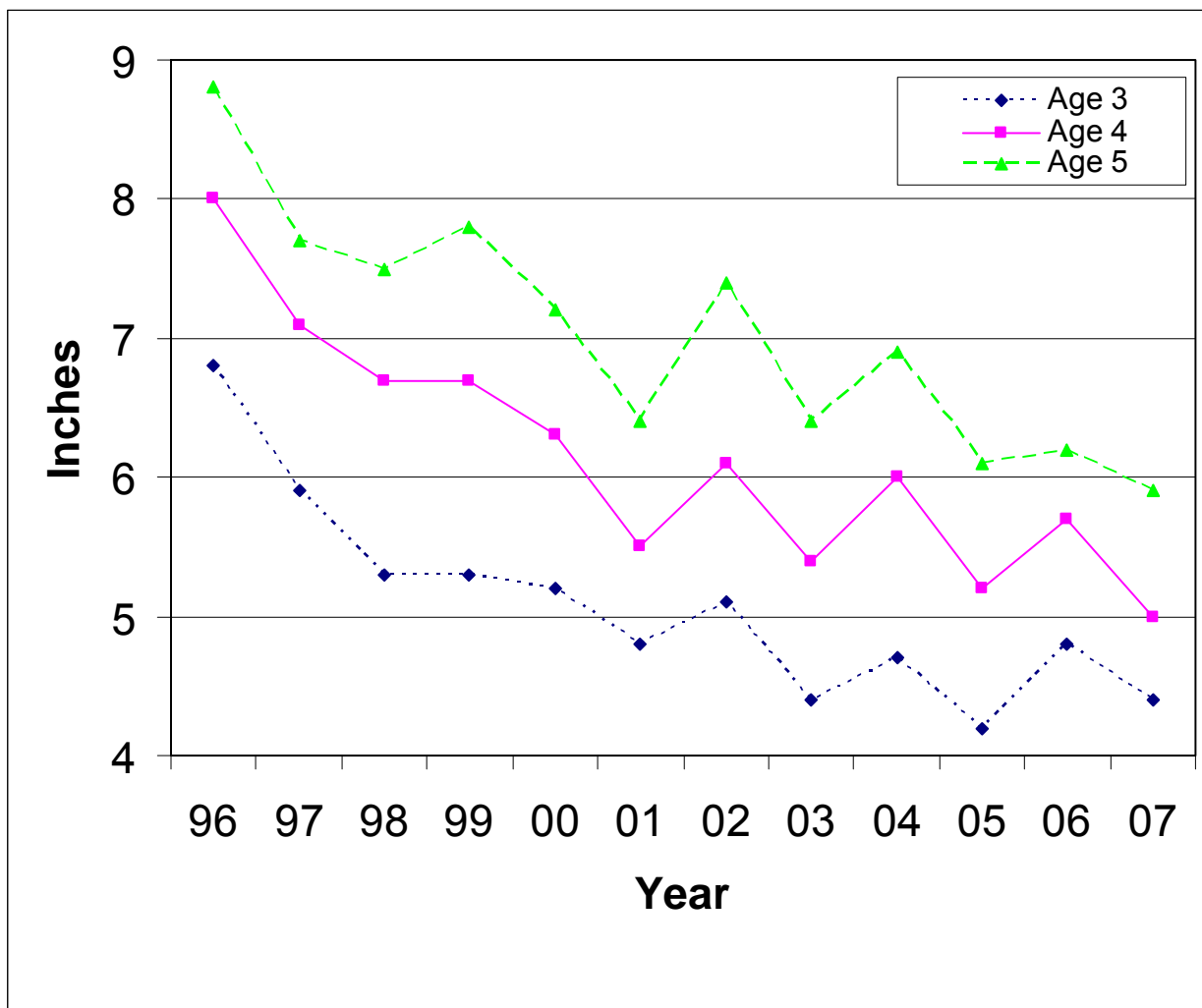


Figure 1. Bluegill growth for age 3 through age 5, 1996 through 2007.

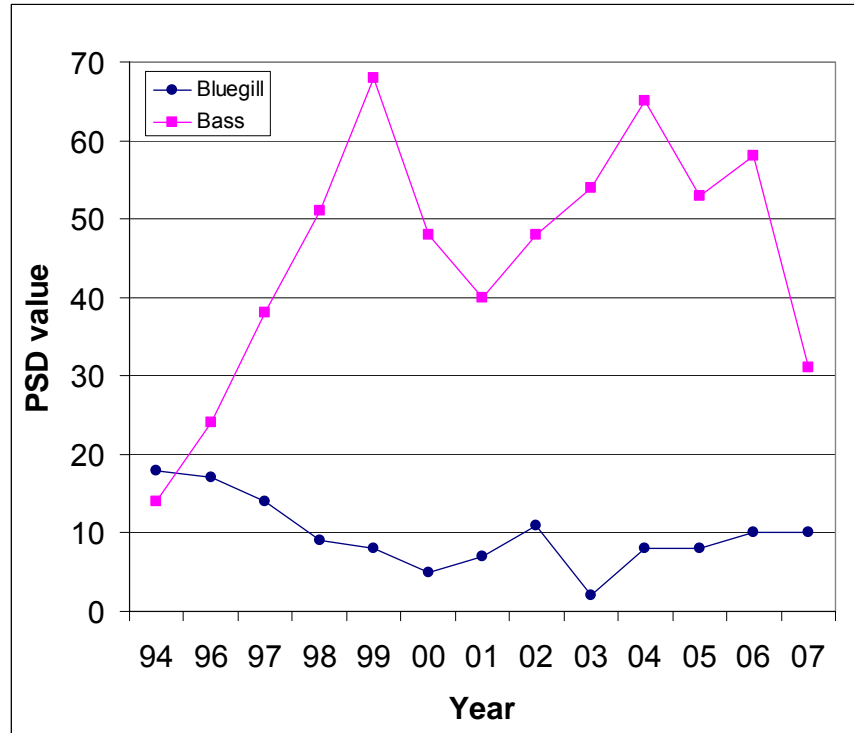


Figure 2. Bluegill and largemouth bass PSD values, 1994 through 2007.

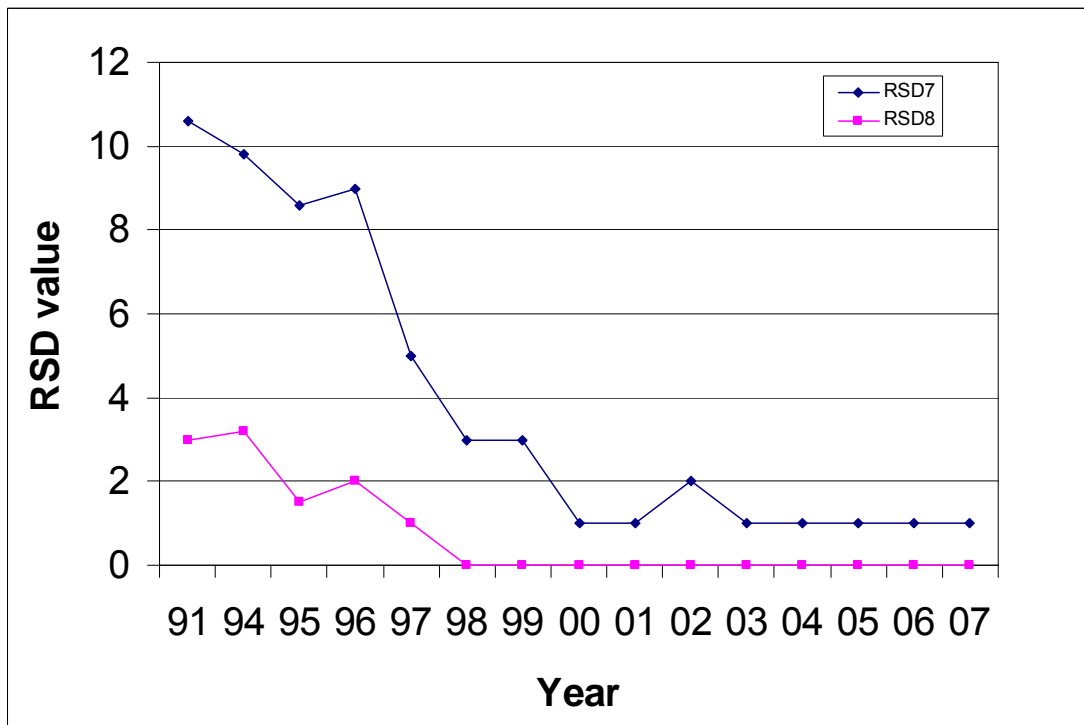


Figure 3. Bluegill RSD values, 1991 through 2007.

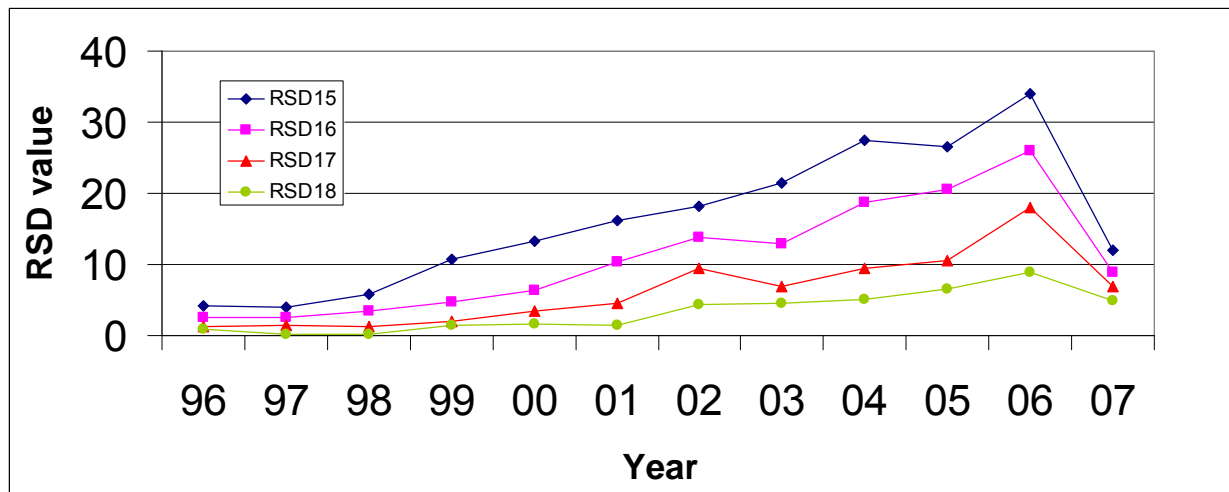


Figure 4. Largemouth bass RSD values, 1996 through 2007.

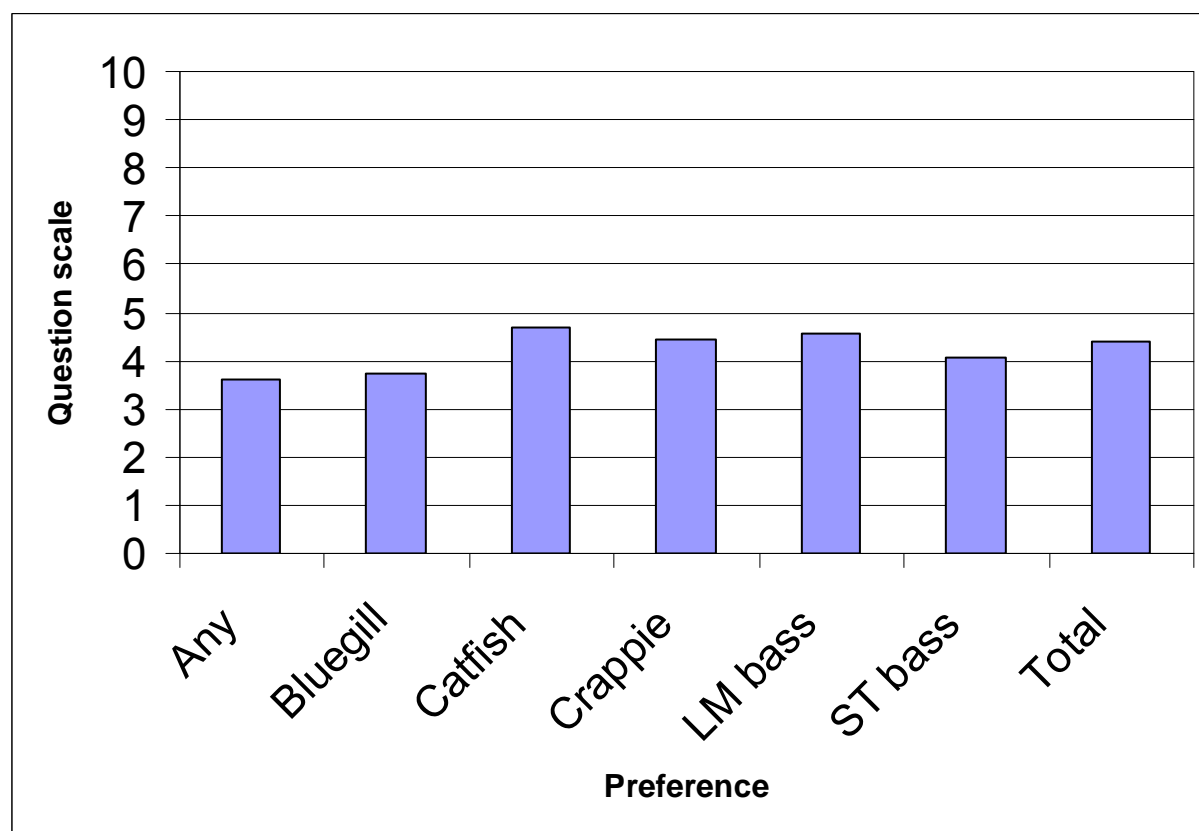


Figure 5. Angler satisfaction with the fishery in 2007 (0 = not satisfied, 10 = very satisfied).



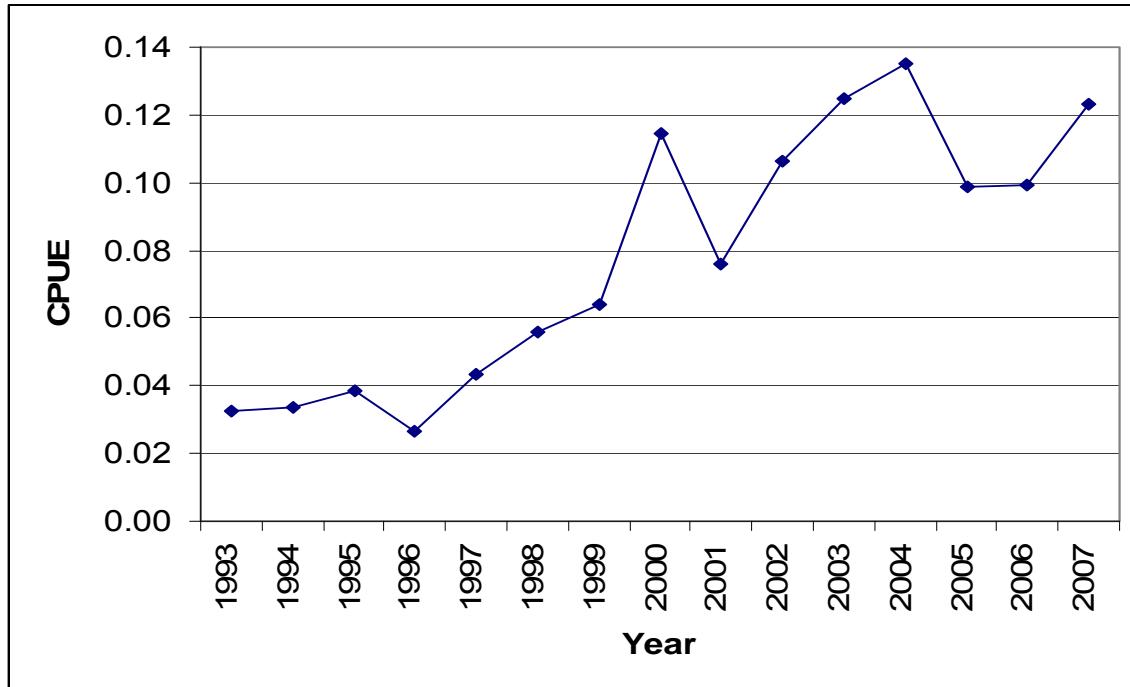


Figure 6. Tournament catch rates for legal size largemouth bass, 1993 through 2007.

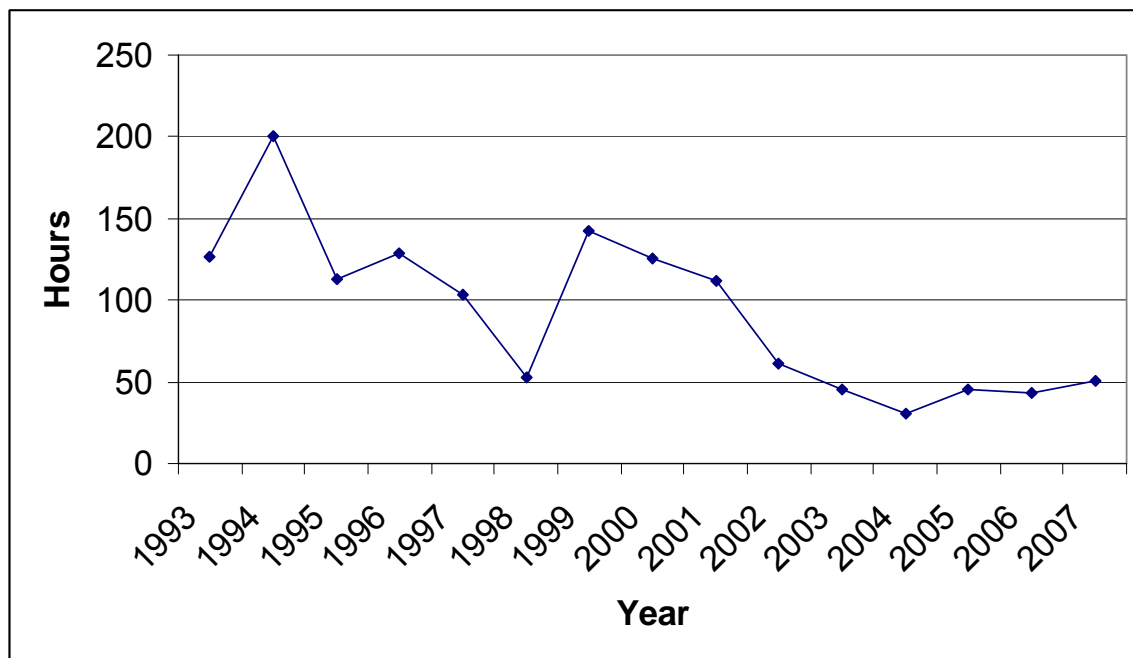


Figure 7. Total fishing hours needed to weigh-in one largemouth bass greater than 18.0 in.

# APPENDIX 1

Supplemental survey data.

# LAKE SURVEY REPORT

Type of Survey	<input type="checkbox"/> Initial Survey	<input checked="" type="checkbox"/> Re-Survey
----------------	---	---

Lake Name	County	Date of survey (Month, day, year)
Patoka Lake	Dubois, Orange, Crawford	April 18 - 21, 2007
Biologist's name	Date of approval (Month, day, year)	
Daniel P. Carnahan	May 21, 2008	

LOCATION		
Quadrangle Name	Range	Section
Birdseye, Cuzco, Greenbrier, Taswell	1W, 2W, 3W	9,16-21,29,30/7-11,14-22, 25-31,33-36/7/1-3,6,10-12/1-12
Township Name	Nearest Town	
1S, 2S	Birdseye	

ACCESSIBILITY					
State owned public access site		Privately owned public access site		Other access site	
10 concrete ramps, 1 unimproved ramp					
Surface acres	Maximum depth	Average depth	Acre feet	Water level	Extreme fluctuations
8,880	52 ft	21 ft	186,480	536 MSL	8 ft
Location of benchmark					
Water level data from operating log for Patoka Lake.					

INLETS					
Name	Location	Origin			
Allen Creek Painter Creek	T2S,R2W,S11 T1S,R2W,S11	T2S,R2W,S36	T1S,R1W,S7		
Cane Branch Patoka River	T1S,R1W,S21 T1S,R1W,S16	T1S,R1W,S22	T1S,R2E,S30		
Dumplin Branch Riceville Creek	T1S,R1W,S29 T2S,R3W,S12	T1S,R1W,S33	T2S,R2W,S20		
Fleming Creek Ritter Creek	T2S,R2W,S10 T2S,R2W,S6	T2S,R2W,S22	T2S,R2W,S21		
Jordan Branch Sycamore Creek	T1S,R2W,S10 T2S,R1W,S7	T1S,R2W,S34	T2S,R1W,S9		
Lickfork Creek Youngs Creek	T2S,R3W,S13 T1S,R1W,S9	T2S,R3W,S24	T1N,R1E,S30		
Patoka River	T1S, R3W, S14				

POOL			ELEVATION (Feet MSL)	ACRES	<b>Bottom type</b> <input checked="" type="checkbox"/> Boulder <input checked="" type="checkbox"/> Gravel <input checked="" type="checkbox"/> Sand <input type="checkbox"/> Muck <input checked="" type="checkbox"/> Clay <input type="checkbox"/> Marl
TOP OF DAM			566		
TOP OF FLOOD CONTROL POOL			548	11,300	
TOP OF CONSERVATION POOL			536	8,880	
TOP OF MINIMUM POOL			506	2,010	
STREAMBED			484		

Watershed use
Forestry, agriculture, livestock (Watershed area is approximately 168 sq mi).
Development of shoreline
Two Patoka Lake State Recreational Areas.

Previous surveys and investigations
Pre-impoundment survey 1972; Fisheries survey of the watershed above, in and below Patoka Lake, 1978.
General fish management surveys: 1981, 1983, 1984, 1987, 1989, 1991, 1994, 1996, 1998, 2000, 2002, 2004, 2006.
Supplemental surveys, 1995, 1997, 1999, 2001, 2003, 2005. Largemouth bass research study, 1985 and 1986.
Angler creel surveys, 1981, 1982, 1985, 1986, 1989, 1991, 1994, 1996, 2000, 2003. Largemouth bass tournament monitoring surveys, 1985, 1986, and 1990 through 2006. Spring crappie surveys, 2002, 2003, 2004.

SAMPLING EFFORT					
ELECTROFISHING	Day hours		Night hours		Total hours
			3.0		3.0
TRAP NETS	Number of traps		Number of Lifts		Total effort
GILL NETS	Number of nets		Number of Lifts		Total effort
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

TEMPERATURE AND DISSOLVED OXYGEN (D.O.)								
DEPTH (FEET)	Degrees (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)
SURFACE	52.0 - 58.0		36			72		
2			38			74		
4			40			76		
6			42			78		
8			44			80		
10			46			82		
12			48			84		
14			50			86		
16			52			88		
18			54			90		
20			56			92		
22			58			94		
24			60			96		
26			62			98		
28			64			100		
30			66					
32			68					
34			70					

COMMENTS
Water chemisty parameters are not measured in supplemental surveys.

\*ppm-parts per million

SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT					
*COMMON NAME OF FISH	NUMBER	PERCENT	LENGTH RANGE (inches)	WEIGHT (pounds)	PERCENT
Bluegill	2,432	61.6	1.0 - 7.0	149.08	15.0
Longear sunfish	557	14.1	1.8 - 5.6	25.94	2.6
Largemouth bass	376	9.5	2.9 - 21.6	245.51	24.7
Gizzard shad	208	5.3	3.5 - 12.0	36.52	3.7
Green sunfish	91	2.3	1.8 - 8.0	4.93	0.5
White crappie	63	1.6	6.0 - 11.6	12.20	1.2
Common carp	56	1.4	10.6 - 31.5	442.95	44.6
Redear sunfish	39	1.0	4.2 - 9.9	6.54	0.7
Steelcolor shiner	29	0.7	2.9 - 3.7	1.08	0.1
Black crappie	25	0.6	3.8 - 8.7	5.01	0.5
Warmouth	25	0.6	4.0 - 7.3	2.68	0.3
Spotter sucker	24	0.6	6.0 - 16.6	31.27	3.1
White bass	7	0.2	6.6 - 12.2	2.40	0.2
Channel catfish	5	0.1	9.5 - 23.6	7.66	0.8
Yellow bullhead	3	0.1	9.7 - 12.3	2.32	0.2
Golden shiner	3	0.1	6.0 - 7.3	0.14	< 0.1
Striped bass	2	0.1	5.5 - 31.5	10.89	1.1
Freshwater drum	2	0.1	13.9 - 16.5	3.69	0.4
Smallmouth bass	2	0.1	12.5 - 16.3	3.06	0.3
Yellow bass	1	< 0.1	7.7	0.21	< 0.1
Bluntnose minnow	1	< 0.1	2.5	0.01	< 0.1
Totals	3,951			994.06	

\*Common names of fishes recognized by the American Fisheries Society.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF BLUEGILL									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0	5	0.2	0.01	1	19.0				
1.5	46	1.9	0.01	1	19.5				
2.0	43	1.8	0.01	1	20.0				
2.5	43	1.8	0.01	1, 2	20.5				
3.0	180	7.4	0.02	2, 3	21.0				
3.5	373	15.3	0.03	2, 3	21.5				
4.0	638	26.2	0.04	2, 3, 4	22.0				
4.5	342	14.1	0.06	3	22.5				
5.0	303	12.5	0.08	3, 4, 5	23.0				
5.5	237	9.7	0.11	3, 4, 5	23.5				
6.0	159	6.5	0.15	4, 5, 6	24.0				
6.5	61	2.5	0.20	5, 6	24.5				
7.0	2	0.1	0.26	7	25.0				
7.5					25.5				
8.0					26.0				
8.5					TOTAL	2,432			
9.0									
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									
ELECTROFISHING CATCH		811.0/h		GILL NET CATCH	n/a		TRAP NET CATCH		n/a

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF LARGEMOUTH BASS									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0	2	0.5	3.90	7
1.5					19.5	1	0.3	4.02	8
2.0					20.0	1	0.3	4.07	9
2.5	1	0.3	0.02	1	20.5	2	0.5	4.74	8, 10
3.0	3	0.8	0.02	1	21.0				
3.5	2	0.5	0.03	1	21.5	1	0.3	4.87	9
4.0	2	0.5	0.03	1	22.0				
4.5	11	2.9	0.04	1, 2	22.5				
5.0	10	2.7	0.05	1, 2	23.0				
5.5	14	3.7	0.07	1	23.5				
6.0	16	4.3	0.09	1, 2	24.0				
6.5	7	1.9	0.12	1, 2	24.5				
7.0	4	1.1	0.15	1, 2	25.0				
7.5	7	1.9	0.18	2	25.5				
8.0	23	6.1	0.23	2	26.0				
8.5	26	6.9	0.26	2	TOTAL	376			
9.0	34	9.0	0.31	2					
9.5	39	10.4	0.36	2					
10.0	32	8.5	0.43	2, 3					
10.5	16	4.3	0.50	2, 3					
11.0	17	4.5	0.58	3, 4					
11.5	18	4.8	0.68	3, 4					
12.0	11	2.9	0.75	3, 4					
12.5	14	3.7	0.87	4					
13.0	8	2.1	0.97	4					
13.5	7	1.9	1.09	4					
14.0	8	2.1	1.25	4, 5					
14.5	10	2.7	1.39	4, 5					
15.0	5	1.3	1.58	4, 5					
15.5	5	1.3	1.84	5					
16.0	1	0.3	1.93	not aged					
16.5	5	1.3	2.31	5, 6					
17.0	3	0.8	2.54	6, 7					
17.5	2	0.5	2.59	7, 8					
18.0	5	1.3	3.05	7, 8					
18.5	3	0.8	3.39	7					
ELECTROFISHING CATCH		125.3/h		GILL NET CATCH	n/a		TRAP NET CATCH	n/a	

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF GIZZARD SHAD									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5	2	1.0	0.01	not aged	21.5				
4.0	7	3.4	0.02		22.0				
4.5	7	3.4	0.03		22.5				
5.0					23.0				
5.5	9	4.3	0.06		23.5				
6.0	46	22.1	0.07		24.0				
6.5	53	25.5	0.10		24.5				
7.0	11	5.3	0.12		25.0				
7.5	9	4.3	0.15		25.5				
8.0	2	1.0	0.18		26.0				
8.5	11	5.3	0.22		TOTAL	208			
9.0	12	5.8	0.27						
9.5	9	4.3	0.32						
10.0	5	2.4	0.37						
10.5	7	3.4	0.43						
11.0	11	5.3	0.57						
11.5	2	1.0	0.57						
12.0	5	2.4	0.65						
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									
ELECTROFISHING CATCH		69.3/h		GILL NET CATCH	n/a		TRAP NET CATCH		n/a



NUMBER, PERCENTAGE, WEIGHT, AND AGE OF WHITE CRAPPIE									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0					22.0				
4.5					22.5				
5.0					23.0				
5.5					23.5				
6.0	8	12.7	0.09	2, 3	24.0				
6.5	8	12.7	0.11	2, 3	24.5				
7.0	15	23.8	0.14	2, 3	25.0				
7.5	14	22.2	0.14	2, 3, 4, 7	25.5				
8.0	6	9.5	0.18	3, 4	26.0				
8.5	5	7.9	0.28	3, 4	TOTAL	63			
9.0	1	1.6	0.35	5					
9.5	1	1.6	0.43	5					
10.0	2	3.2	0.51	3, 6					
10.5									
11.0	1	1.6	0.68	5					
11.5	2	3.2	0.79	6					
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									
ELECTROFISHING CATCH		21.0/h		GILL NET CATCH	n/a		TRAP NET CATCH	n/a	

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF REDEAR SUNFISH									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5	1	2.6	0.03	2	21.5				
4.0	1	2.6	0.04	2	22.0				
4.5	5	12.8	0.06	2, 3	22.5				
5.0	4	10.3	0.08	2, 3	23.0				
5.5	5	12.8	0.11	3	23.5				
6.0	8	20.5	0.15	3, 4	24.0				
6.5	6	15.4	0.20	3, 4, 5	24.5				
7.0	5	12.8	0.25	4, 5, 6	25.0				
7.5	2	5.1	0.31	6, 7	25.5				
8.0					26.0				
8.5	1	2.6	0.44	5	TOTAL	39			
9.0									
9.5	1	2.6	0.62	7					
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									
ELECTROFISHING CATCH		13.0/h		GILL NET CATCH	n/a		TRAP NET CATCH		n/a

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF BLACK CRAPPIE									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5	1	4.0	0.04	2	21.5				
4.0					22.0				
4.5					22.5				
5.0					23.0				
5.5	1	4.0	0.09	2	23.5				
6.0	2	8.0	0.11	2	24.0				
6.5	1	4.0	0.13	4	24.5				
7.0	6	24.0	0.19	3, 4, 5	25.0				
7.5	3	12.0	0.23	4, 5	25.5				
8.0	9	36.0	0.25	4, 5, 6	26.0				
8.5	2	8.0	0.32	4	TOTAL	25			
9.0									
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									
ELECTROFISHING CATCH		8.3/h		GILL NET CATCH	n/a		TRAP NET CATCH	n/a	

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF CHANNEL CATFISH									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0					22.0				
4.5					22.5				
5.0					23.0				
5.5					23.5	1	20.0	5.30	
6.0					24.0				
6.5					24.5				
7.0					25.0				
7.5					25.5				
8.0					26.0				
8.5					TOTAL	5			
9.0									
9.5	2	40.0	0.28	not aged					
10.0	1	20.0	0.32						
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5	1	20.0	1.48						
17.0									
17.5									
18.0									
18.5									
ELECTROFISHING CATCH		2.0/h		GILL NET CATCH	n/a		TRAP NET CATCH		n/a

BLUEGILL AGE-LENGTH KEY									
Length group (in)	Total number	Sub- sample	1	2	3	AGE 4	5	6	7
1.0	5	2	5						
1.5	46	2	46						
2.0	43	5	43						
2.5	43	5	26	17					
3.0	180	5		72	108				
3.5	373	5		224	149				
4.0	638	5		128	255	255			
4.5	342	5			342				
5.0	303	5			121	121	61		
5.5	237	5			47	95	95		
6.0	159	6				80	53	27	
6.5	61	5					37	24	
7.0	2	1							2
Totals	2,432	56	120	441	1,023	551	245	51	2

AGE-LENGTH KEY SUMMARY							
Age	Number	Mean		SE	Lower		Upper
		TL	Var		95%CI	95%CI	95%CI
1	120	2.1	0.33	0.05	2.0	2.2	
2	441	3.8	0.15	0.02	3.7	3.8	
3	1,023	4.4	0.42	0.02	4.4	4.5	
4	551	5.0	0.60	0.03	5.0	5.1	
5	245	5.9	0.25	0.03	5.8	5.9	
6	51	6.5	0.06	0.04	6.4	6.6	
7	2	7.3	0.00	0.00	7.3	7.3	

# LARGEMOUTH BASS AGE-LENGTH KEY

Length group (in)	Total number	Sub- sample	AGE									
			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
2.5	1	1	1									
3.0	3	3	3									
3.5	2	2	2									
4.0	2	2	2									
4.5	11	4	8	3								
5.0	10	4	5	5								
5.5	14	5	14									
6.0	16	5	13	3								
6.5	7	6	2	5								
7.0	4	4	2	2								
7.5	7	5		7								
8.0	23	3		23								
8.5	26	5		26								
9.0	34	5		34								
9.5	39	5		39								
10.0	32	5		13	19							
10.5	16	5		3	13							
11.0	17	5			14	3						
11.5	18	5			11	7						
12.0	11	4			3	8						
12.5	14	6				14						
13.0	8	5				8						
13.5	7	3				7						
14.0	8	5				5	3					
14.5	10	4				8	3					
15.0	5	4				1	4					
15.5	5	4				1	4					
16.0	1	0										
16.5	5	4					3	3				
17.0	3	3						2	1			
17.5	2	2							1	1		
18.0	5	4							3	3		
18.5	3	2							3			
19.0	2	1							2			
19.5	1	1								1		
20.0	1	1									1	
20.5	2	2								1		1
21.0												
21.5	1	1									1	
Totals	376	135	52	163	59	63	16	5	10	6	2	1

## AGE-LENGTH KEY SUMMARY

Age	Number	Mean		SE	Lower 95%CI	Upper 95%CI
		TL	Var			
1	52	5.4	1.06	0.14	5.1	5.7
2	163	8.8	1.54	0.10	8.6	9.0
3	59	11.0	0.39	0.08	10.8	11.1
4	63	13.1	1.25	0.14	12.8	13.4
5	16	15.3	0.70	0.21	14.9	15.7
6	5	17.0	0.08	0.13	16.7	17.2
7	10	18.5	0.42	0.21	18.0	18.9
8	6	18.9	1.45	0.51	17.9	19.9
9	2	21.0	1.13	0.75	19.5	22.5
10	1	20.8				

WHITE CRAPPIE AGE-LENGTH KEY									
Length group (in)	Total number	Sub- sample	1	2	3	AGE 4	5	6	7
6.0	8	5		2	6				
6.5	8	5		3	5				
7.0	15	8		13	2				
7.5	14	8		4	7	2			2
8.0	6	5			4	2			
8.5	5	5			3	2			
9.0	1	1					1		
9.5	1	1					1		
10.0	2	2			1			1	
10.5									
11.0	1	1					1		
11.5	2	2						2	
Totals	63	43	0	21	28	6	3	3	2

AGE-LENGTH KEY SUMMARY						
Age	Number	Mean		SE	Lower	Upper
		TL	Var		95%CI	95%CI
1						
2	21	7.2	0.16	0.09	7.0	7.4
3	28	7.5	1.03	0.19	7.1	7.8
4	6	8.3	0.18	0.17	7.9	8.6
5	3	10.1	1.08	0.60	8.9	11.3
6	3	11.3	0.75	0.50	10.3	12.3
7	2	7.8	0.00	0.00	7.8	7.8

REDEAR SUNFISH AGE-LENGTH KEY									
Length group (in)	Total number	Sub- sample	AGE						
			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
3.5	1	1		1					
4.0	1	1		1					
4.5	5	5		2	3				
5.0	4	4		1	3				
5.5	5	5			5				
6.0	8	8			6	2			
6.5	6	6			1	2	3		
7.0	5	5				2	1	2	
7.5	2	2						1	1
8.0									
8.5	1	1					1		
9.0									
9.5	1	1							1
Totals	39	39	0	5	18	6	5	3	2

AGE-LENGTH KEY SUMMARY						
Age	Number	Mean			Lower 95%CI	Upper 95%CI
		TL	Var	SE		
1						
2	5	4.6	0.33	0.25	4.0	5.1
3	18	5.7	0.37	0.14	5.4	6.0
4	6	6.8	0.20	0.18	6.4	7.1
5	5	7.3	0.75	0.39	6.5	8.0
6	3	7.4	0.08	0.17	7.1	7.8
7	2	8.8	2.00	1.00	6.8	10.8



BLACK CRAPPIE AGE-LENGTH KEY								
Length group (in)	Total number	Sub- sample	AGE					
			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
3.5	1	1		1				
4.0								
4.5								
5.0								
5.5	1	1		1				
6.0	2	2		2				
6.5	1	1				1		
7.0	6	6			1	4	1	
7.5	3	3				2	1	
8.0	9	6				5	3	2
8.5	2	2				2		
Totals	25	22	0	4	1	14	5	2

AGE-LENGTH KEY SUMMARY						
Age	Number	Mean		SE	Lower	Upper
		TL	Var		95%CI	95%CI
1						
2	4	5.5	1.42	0.60	4.3	6.7
3	1	7.3				
4	14	7.8	0.40	0.17	7.5	8.2
5	5	8.0	0.20	0.20	7.6	8.4
6	2	8.3	0.00	0.00	8.3	8.3

GPS LOCATION OF SAMPLING EQUIPMENT								
GILL NETS			TRAP NETS			ELECTROFISHING		
1	N	W	1	N	W	1	N 38.37287	W -86.68850
2	N	W	2	N	W		N 38.36908	W -86.68722
3	N	W	3	N	W	2	N 38.36910	W -86.68337
4	N	W	4	N	W		N 38.37280	W -86.68487
5	N	W	5	N	W	3	N 38.37363	W -86.68477
6	N	W	6	N	W		N 38.37502	W -86.68157
7	N	W	7	N	W	4	N 38.37748	W -86.67793
8	N	W	8	N	W		N 38.37713	W -86.68328
9	N	W	9	N	W	5	N 38.43848	W -86.60617
10	N	W	10	N	W		N 38.43835	W -86.60795
11	N	W	11	N	W	6	N 38.43850	W -86.60813
12	N	W	12	N	W		N 38.43855	W -86.61463
13	N	W	13	N	W	7	N 38.43918	W -86.61608
14	N	W	14	N	W		N 38.44088	W -86.61923
15	N	W	15	N	W	8	N 38.43767	W -86.61997
16	N	W	16	N	W		N 38.43568	W -86.61723
17	N	W	17	N	W	9	N 38.40303	W -86.56893
18	N	W	18	N	W		N 38.40278	W -86.56592
19	N	W	19	N	W	10	N 38.40258	W -86.56507
20	N	W	20	N	W		N 38.40347	W -86.56493
						11	N 38.40383	W -86.56608
							N 38.40568	W -86.56278
						12	N 38.40800	W -86.56430
							N 38.40562	W -86.56855
						13	N	W
							N	W
						14	N	W
							N	W
						15	N	W
							N	W
						16	N	W
							N	W
						17	N	W
							N	W
						18	N	W
							N	W
						19	N	W
							N	W
						20	N	W
							N	W

## Appendix 2. Largemouth bass tournament results for 2007.

Length (in)	Tournament dates																							
	3/21	3/24	3/25	4/1	4/15	4/22	4/28	5/5	5/12	5/18	5/19	6/16	6/17	6/23	6/23	7/8	7/25	7/28	8/19	8/25	9/8	10/6	10/7	10/14
15.0							9	29	10						3			3		31				
15.5							8	3	12						3			8		7				
16.0							12	31	17						4			7		8				
16.5							9	2	9					1	3			2		1				
17.0							5	7	9						7			12		5				
17.5							9		10						2			9						
18.0							4	14	10					1	5			18		3				
18.5							5		5						3			3		1				
19.0							6	6	9						2			5		1				
19.5							1		1						2			3						
20.0							2	2	2									4						
20.5							5											1						
21.0									1									1		1				
21.5																								
22.0																								
22.5							1		1															
# of bass caught	44	375	168	66	253	148	76	94	96	207	158	204	166	2	34	203	60	76	75	58	340	130	112	80
# of anglers	80	356	176	64	260	196	64	126	106	168	168	228	162	4	34	212	56	60	148	108	222	120	120	250
Tourn. length (hrs)	7.50	8.00	8.00	8.00	9.00	9.00	8.00	8.50	8.00	8.00	8.00	9.00	9.00	5.00	7.00	8.00	3.50	8.50	10.00	8.00	8.25	9.00	9.00	8.00
Catch rate (#/hour)	0.073	0.132	0.119	0.129	0.108	0.084	0.148	0.088	0.113	0.154	0.118	0.099	0.114	0.100	0.143	0.120	0.306	0.149	0.051	0.067	0.186	0.120	0.104	0.040
Wt. of big bass (lbs)	6.0	7.2	6.8	*	*	7.3	5.9	5.4	5.5	*	*	5.7	6.4	3.3	4.9	*	6.4	5.5	6.0	5.7	5.1	5.6	6.3	5.5
Total weight	140.2	1,184.1	488.4	212.6	809.0	441.8	224.7	248.4	252.2	526.8	439.6	563.5	467.1	6.0	94.7	557.7	181.7	224.0	198.9	146.3	860.0	343.7	288.1	236.6
Avg wt of all bass	3.2	3.2	2.9	3.2	3.2	3.0	3.0	2.6	2.6	2.5	2.8	2.8	2.8	3.0	2.8	2.7	3.0	2.9	2.7	2.5	2.5	2.6	2.6	3.0

\* Not reported. Measuring bass was optional.

## APPENDIX 3

Striped bass survey data.

SAMPLING EFFORT					
ELECTROFISHING	Day hours		Night hours		Total hours
			5.75		5.75
TRAP NETS	Number of traps		Number of Lifts		Total effort
GILL NETS	Number of nets		Number of Lifts		Total effort
	4		4		16 overnight lifts
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

TEMPERATURE AND DISSOLVED OXYGEN (D.O.)-- October 5								
DEPTH (FEET)	Degrees (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)
SURFACE	75.0	8.7	36			72		
2	75.0	8.7	38			74		
4	75.0	8.7	40			76		
6	75.0	8.7	42			78		
8	75.0	8.7	44			80		
10	74.0	8.3	46			82		
12	74.0	8.4	48			84		
14	74.0	8.3	50			86		
16	73.5	8.0	52			88		
18	73.5	8.0	54			90		
20	73.5	8.0	56			92		
22	73.5	8.0	58			94		
24	72.0	3.1	60			96		
26	68.5	1.1	62			98		
28	64.5	1.4	64			100		
30	61.0	1.4	66					
32			68					
34			70					

COMMENTS								

\*ppm-parts per million

TEMPERATURE AND DISSOLVED OXYGEN (D.O.)-- October 29								
DEPTH (FEET)	Degrees (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)
SURFACE	62.0	6.5	36	62.0	6.9	72		
2	62.0	6.5	38 (bottom)	58.5	1.7	74		
4	62.0	6.5	40			76		
6	62.0	6.5	42			78		
8	62.0	6.5	44			80		
10	62.0	6.6	46			82		
12	62.0	6.6	48			84		
14	62.0	6.6	50			86		
16	62.0	6.7	52			88		
18	62.0	6.7	54			90		
20	62.0	6.8	56			92		
22	62.0	6.9	58			94		
24	62.0	6.9	60			96		
26	62.0	6.9	62			98		
28	62.0	6.9	64			100		
30	62.0	7.0	66					
32	62.0	7.0	68					
34	62.0	7.0	70					
COMMENTS								

\*ppm-parts per million

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF STRIPED BASS									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5	1	0.6	2.50	2
2.0					20.0				
2.5					20.5	1	0.6	4.25	2
3.0					21.0				
3.5	2	1.3	0.06	0	21.5				
4.0	1	0.6	0.07	0	22.0				
4.5	1	0.6	0.07	0	22.5				
5.0					23.0				
5.5					23.5				
6.0					24.0				
6.5					24.5				
7.0					25.0				
7.5					25.5	4	2.6	5.00	5
8.0					26.0	7	4.5	6.25	5
8.5					26.5	6	3.8	8.11	not aged
9.0	7	4.5	0.25	1	27.0	6	3.8	6.75	5
9.5	10	6.4	0.29	1	27.5	2	1.3	7.25	5
10.0	20	12.8	0.37	1	28.0	2	1.3	8.69	not aged
10.5	13	8.3	0.38	1	28.5	4	2.6	7.00	8
11.0	3	1.9	0.38	not aged	29.0	4	2.6	8.50	8, 9
11.5					29.5	5	3.2	8.50	8
12.0					30.0	12	7.7	8.59	8
12.5					30.5	8	5.1	8.76	9, 10
13.0					31.0	5	3.2	9.80	not aged
13.5					31.5	6	3.8	9.33	9, 10
14.0					32.0	4	2.6	10.00	not aged
14.5					32.5	5	3.2	11.25	not aged
15.0					33.0	7	4.5	11.12	9, 10
15.5	1	0.6	1.25	2	33.5	3	1.9	11.25	9
16.0	1	0.6	1.50	2	34.0	2	1.3	11.50	9, 10
16.5					34.5	1	0.6	13.00	not aged
17.0					35.0	1	0.6	12.50	10
17.5					35.5				
18.0					36.0	1	0.6	15.75	not aged
18.5					TOTAL	156			
ELECTROFISHING CATCH		21.7/h		GILL NET CATCH	1.9/lift		TRAP NET CATCH		NA

STRIPED BASS AGE-LENGTH KEY										
Length group (in)	Total number	Sub- sample	AGE							
			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
3.5	2	2								
4.0	1	1								
4.5	1	1								
5.0										
5.5										
6.0										
6.5										
7.0										
7.5										
8.0										
8.5										
9.0	7	1	7							
9.5	10	2	10							
10.0	20	6	20							
10.5	13	5	13							
11.0	3									
11.5										
12.0										
12.5										
13.0										
13.5										
14.0										
14.5										
15.0										
15.5	1	1		1						
16.0	1	1		1						
16.5										
17.0										
17.5										
18.0										
18.5										
19.0										
19.5	1	1		1						
20.0										
20.5	1	1		1						
21.0										
21.5										
22.0										
22.5										
23.0										
23.5										
24.0										
24.5										
25.0										
25.5	4	1					4			
26.0	7	2					7			
26.5	6									
27.0	6	2					6			
27.5	2	1					2			
28.0	2									
28.5	4	1								4
29.0	4	2								2
29.5	5	1								5
30.0	12	5								12
30.5	8	3								
31.0	5									
31.5	6	2								
32.0	4									
32.5	5									
33.0	7	2								
33.5	3	1								
34.0	2	2								
34.5	1									
35.0	1	1								
35.5										
36.0	1									
Totals	156	48	50	4	0	0	19	0	0	23



STRIPED BASS						
AGE-LENGTH KEY SUMMARY						
Age	Number	Mean		SE	Lower	Upper
		TL	Var		95%CI	95%CI
1	50	10.1	0.25	0.07	10.0	10.3
2	4	18.1	6.23	1.25	15.6	20.6
3						
4						
5	19	26.6	0.50	0.16	26.3	26.9
6						
7						
8	23	29.8	0.34	0.12	29.6	30.0
9	15	32.2	2.74	0.43	31.3	33.0
10	14	32.2	2.27	0.41	31.4	33.0

GPS LOCATION OF SAMPLING EQUIPMENT								
GILL NETS			ELECTROFISHING			ELECTROFISHING		
1	N 38.42181	W -86.65779	1	N 38.39227	W -86.62565	11	N 38.40577	W -86.62570
2	N 38.42847	W -86.69961		N 38.39153	W -86.61909		N 38.40710	W -86.70519
3	N 38.42671	W -86.70058	2	N 38.39306	W -86.63348	12	N 38.40883	W -86.71102
4	N 38.43141	W -86.70231		N 38.39095	W -86.62992		N 38.40645	W -86.70532
5	N 38.43074	W -86.69893	3	N 38.39307	W -86.63371	13	N 38.42595	W -86.70530
6	N 38.43402	W -86.68471		N 38.39141	W -86.63797		N 38.42246	W -86.71105
7	N 38.43144	W -86.69871	4	N 38.39740	W -86.63646	14	N 38.43038	W -86.70703
8	N 38.43369	W -86.69583		N 38.39658	W -86.63105		N 38.42882	W -86.71379
9	N 38.42609	W -86.70022	5	N 38.42902	W -86.63658	15	N 38.43838	W -86.69030
10	N 38.43185	W -86.69908		N 38.42798	W -86.64269		N 38.43640	W -86.68490
11	N 38.43908	W -86.69686	6	N 38.42493	W -86.64849	16	N 38.43685	W -86.66495
12	N 38.43330	W -86.69162		N 38.42332	W -86.64281		N 38.43330	W -86.66874
13	N 38.41832	W -86.64767	7	N 38.41921	W -86.63352	17	N 38.42151	W -86.65994
14	N 38.41514	W -86.64889		N 38.41391	W -86.63449		N 38.41800	W -86.66499
15	N 38.41923	W -86.65122	8	N 38.41019	W -86.61489	18	N 38.41762	W -86.66529
16	N 38.43334	W -86.69088		N 38.41009	W -86.62173		N 38.41364	W -86.66970
17	N	W	9	N 38.40558	W -86.61495	19	N 38.41582	W -86.67689
18	N	W		N 38.40024	W -86.61600		N 38.41216	W -86.67142
19	N	W	10	N 38.39328	W -86.61526	20	N 38.42419	W -86.68544
20	N	W		N 38.38863	W -86.61522		N 38.41948	W -86.68354
						21	N 38.43049	W -86.69218
							N 38.42847	W -86.69489
						22	N 38.42121	W -86.70365
							N 38.41569	W -86.70136
						23	N 38.40788	W -86.63795
							N 38.40509	W -86.63209
						24	N 38.41391	W -86.65389
							N 38.41189	W -86.64850